

What is claimed is:

1. A liquid composition, preparable by  
(co)polymerizing olefinically unsaturated  
5 compounds in reactive diluents for thermally  
curable multisubstance mixtures as reaction  
medium.
- 10 2. A homopolymer or copolymer of olefinically  
unsaturated compounds preparable by  
(co)polymerizing the compounds in reactive  
diluents for thermally curable multisubstance  
mixtures as reaction medium.
- 15 3. A liquid composition as claimed in claim 1 or  
homopolymer or copolymer as claimed in claim 2,  
wherein polyols and/or epoxides are used as  
reactive diluents.
- 20 4. A liquid composition or a homopolymer or copolymer  
as claimed in claim 3, wherein the polyols used  
comprise
- 25 (i) hyperbranched compounds containing a  
tetrafunctional central group derived from  
ditrimethylolpropane, diglycerol and/or

5N  
A  
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ditrimethylolethane or a tetrafunctional  
central group of the general formula I



5 in which the indices and variables have the  
following definitions:

$m + n + o + p = 4$ ; where

m is an integer from 1 to 3, and

n, o and p are 0 or an integer from 1 to 3;

q, r, s and t are an integer from 1 to 5,  
where  $q \geq r, s, t$ , especially  $q > r, s, t$ ;

15 X is -O-, -S- or -NH-;

A is -CR<sub>2</sub>-; where

R is -H, -F, -Cl, -Br, -CN, -NO<sub>2</sub>,  
C<sub>1</sub>-C<sub>3</sub> alkyl or haloalkyl or C<sub>1</sub>-C<sub>3</sub>  
alkoxy radical or, if q, r, s  
20 and/or t are at least 2, R is a  
C<sub>2</sub>-C<sub>4</sub> alkanediyl and/or  
oxaalkanediyl radical having 2  
to 5 carbon atoms and/or an  
25 oxygen atom -O- which bridges  
from 3 to 5 carbon atoms of the  
radical -A-;

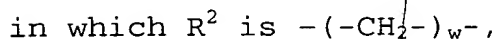
(ii) cyclic and/or acyclic C<sub>9</sub>-C<sub>16</sub> alkanes

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- the polyols (I) used comprise a hyperbranched compound obtainable by reacting 2,2-

bishydroxymethylbutane-1,4-diol with phthalic anhydride and then reacting the resultant intermediate with glycidyl esters of tertiary, highly branched, saturated monocarboxylic acids,

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- the polyols (ii) used comprise dialkyloctanediols, especially diethyloctanediols, and

- the polyols (iii) used comprise hydroformylated and hydrogenated oligomers, obtainable by metathesis from acyclic monoolefins and cyclic monoolefins, hydroformylation of the resultant oligomers and subsequent hydrogenation, the cyclic monoolefin used comprising cyclopentene and the acyclic monoolefins used comprising hydrocarbon mixtures obtained in petroleum processing by cracking ( $C_5$  cut), and the polyols (iii) having a hydroxyl number (OHN) of from 200 to 650, in particular from 250 to 450, a number-average molecular weight  $M_n$  of from 400 to 1 000, in particular from 400 to 600, a mass-average molecular weight  $M_w$  in the range from 600 to 2 000, in particular from 600 to 1 100, and a polydispersity  $M_n/M_w$  from 1.4 to 3, in particular from 1.7 to 1.9.

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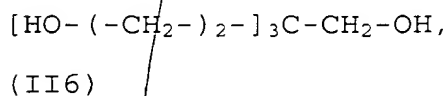
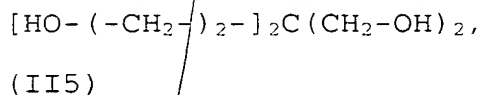
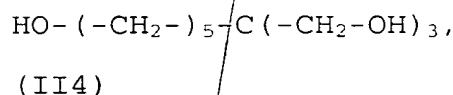
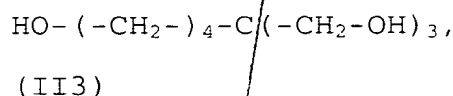
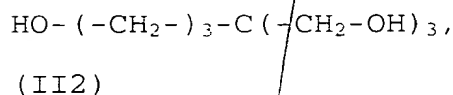
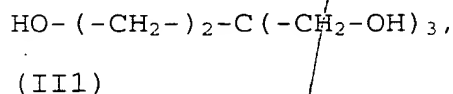
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6. A liquid composition or a homopolymer or copolymer

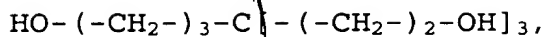
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(iv) glycidyl ethers of polyols or polyphenols such as glycerol, diglycerol, glucitol, erythritol, pentaerythritol, dipentaerythritol, trimethylolpropane, trimethylolethane, ditrimethylolpropane, ditrimethylolethane, tetrakis(2-hydroxyethyl)ethane, tetrakis(3-hydroxypropyl)methane, the tetraols III1 to III10:

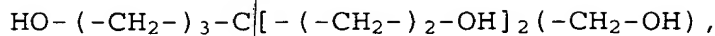
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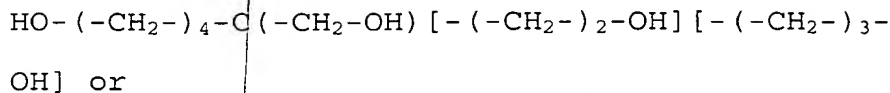


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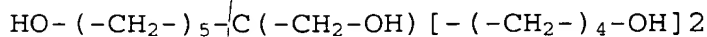
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(II8)



(II9)



(III10);

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the polyols (i), (ii) and (iii), pyrocatechol, resorcinol, hydroquinone, pyrogallol, phloroglucinol, (p-hydroxyphenyl)phloroglucinol, 5-(7-hydroxynaphth-1-yl)pyrogallol, bisphenol F, bisphenol A or novolaks;

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(v) low molecular mass epoxy resins or oligomers which contain glycidyl-containing monomers (A6) in copolymerized form;

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(vi) glycidyl esters of Versatic® acid;

(vii) epoxy resin esters of saturated and unsaturated fatty acids (epoxidized oils);

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and/or

(viii) epoxidized triglycerides of natural oils and esters.

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7.

*Mult*  
A liquid composition as claimed in any of claims 1 or 3 to 6 or a homopolymer or copolymer as claimed in any of claims 2 to 6, preparable by homopolymerization or copolymerization of olefinically unsaturated monomers in a Taylor reactor having an external reactor wall located within which there is a concentrically or eccentrically disposed rotor, a reactor floor and a reactor lid, which together define the annular reactor volume, at least one means for metered addition of reactants, and a means for the discharge of product, where the reactor wall and/or the rotor are or is geometrically designed in such a way that the conditions for Taylor vortex flow are met over substantially the entire reactor length in the reactor volume, i.e. in such a way that the annular gap broadens in the direction of flow traversal.

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25 8. A process for preparing a liquid composition or a homopolymer or copolymer of olefinically unsaturated compounds by free-radical (co)polymerization in a liquid reaction medium, which comprises using reactive diluents for

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thermally curable multisubstance mixtures as the reaction medium.

5 9. The process as claimed in claim 8, wherein a fraction of the reactive diluents is modified after the (co)polymerization with olefinically unsaturated compounds, especially with monomers (A2), (A5) and/or (A6), so that the resulting liquid composition is curable both thermally and by actinic light and/or electron beams.

10 10. The process as claimed in claim 8 or 9, conducted in a Taylor reactor having an external reactor wall located within which there is a  
15 concentrically or eccentrically disposed rotor, a reactor floor and a reactor lid, which together define the annular reactor volume, at least one means for metered addition of reactants, and a means for the discharge of product, where the  
20 reactor wall and/or the rotor are or is geometrically designed in such a way that the conditions for Taylor vortex flow are met over substantially the entire reactor length in the reactor volume, i.e. in such a way that the  
25 annular gap broadens in the direction of flow traversal.

11. The use of a liquid composition as claimed in any of claims 1 and 2 to 7, of a homopolymer or

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copolymer as claimed in any of claims 2 to 7 or of  
a liquid composition or homopolymer or copolymer  
prepared as claimed in any of claims 8 to 10 to  
prepare coating compositions, adhesives or sealing  
5 compounds curable thermally or curable thermally  
and with actinic light and/or electron beams.

add  $a^2$